CLAIM AMENDMENTS

1 - 12. (CANCELED)

13. (CURRENTLY AMENDED): A ~~computer program product comprising executable code for a~~ method of determining process matching of one or more process tools so that the one or more process tools running the same process produce substantially the same results for processing workpieces, the method uses ~~method of matching~~ a first data set and a second data set where the first data set includes an operating characteristic measured while running the process and the second data set includes the operating characteristic measured while running the process ~~include an operating characteristic for a process~~, the method comprising ~~the steps of~~:

i. fingerprinting the one or more process tools using the first data set and the second data set;

ii. finding correspondences between transition points in the first data set and the second data set; and

iii. comparing the first data set and second data set using the correspondences from step ii to determine whether there is process matching for the one or more process tools running the same process; ~~the first data set and the second data set match,~~

wherein step i comprises:

A. detecting transition points in the first data set and the second data set so as to define data intervals wherein each data interval comprises the data between successive transition points;

B. computing a best fit of the data in each of the data intervals using basis functions; and

C. computing fitting errors between the data in the data intervals and the best fit and determining if the errors are less than a predetermined threshold and recursively finding additional transition points as necessary to produce fitting errors less than the threshold.

14. (ORIGINAL): The method of claim 13 further comprising displaying the comparison results from step iii.

15. (CURRENTLY AMENDED): The method of claim 13 further comprising generating an alarm if there is no process matching ~~the first data set and second data set do not match~~.

16. (ORIGINAL): The method of claim 13 wherein the first data set and second data set include the operating characteristic being a function of time; the method further comprising time-stretching at least one portion of the first data set and of the second data set by inserting interpolated values so as to produce an equal number of data points in each portion of the data sets, so that the first data set and the second data set have substantially the same time reference for step iii.

17. (CANCELED)

18. (ORIGINAL): The method of claim 13 wherein the process comprises an electronic device fabrication process and the first data set comprises temperatures of a semiconductor wafer as a function of time and the second data set comprises temperatures of a semiconductor wafer as a function of time.

19. (ORIGINAL): The method of claim 13 wherein the process comprises an electronic device fabrication process.

20. (CURRENTLY AMENDED): A method of ~~matching~~ process matching one or more semiconductor-wafer-process tools, the method uses a first data set and a second data set where the first data set and the second data set include temperature measurements as a function of time for a process performed ~~on a semiconductor wafer in a process tool~~ in the one or more semiconductor-wafer-process tools, the method comprising ~~the steps of~~:

i. fingerprinting the one or more semiconductor-wafer-process tools by ~~the first data set and the second data set using the steps of~~

A. detecting transition points in the first data set and the second data set so as to define data intervals wherein each data interval comprises temperature data between successive transition points;

B. computing a best fit of the temperature data in each of the data intervals using basis functions; and

C. computing fitting errors between the temperature data in the data intervals and the best fit and determining if the errors are less than a predetermined threshold and recursively finding additional transition points as necessary to produce fitting errors less than the threshold;

ii. finding correspondences between transition points in the first data set and the second data set; and

iii. comparing the first data set and second data set using the correspondences from step ii to determine whether the first data set and the second data set match so as to show whether there is process matching of the one or more semiconductor-wafer-process tools.

21. (PREVIOUSLY PRESENTED): The method of claim 20 further comprising time-stretching at least one portion of the first data set and of the second data set by inserting interpolated values so as to produce an equal number of data points in each portion of the data sets, so that the first data set and the second data set have substantially the same time reference for step iii.

22. (CURRENTLY AMENDED): A computer readable medium containing executable steps for a method of determining if maintenance is required for a process tool used to perform a process on workpieces, the method uses ~~method of matching~~ a first data set and a second data set where the first data set includes an operating characteristic measured while running the process on the process tool and the second data set includes the operating characteristic measured while running the process ~~include an operating characteristic for a process~~, the method comprising ~~the steps of~~:

i. fingerprinting the first data set and the second data set;

ii. finding correspondences between transition points in the first data set and the second data set; and

iii. comparing the first data set and second data set using the correspondences from step ii to determine whether the first data set and the second data set match, and

indicating maintenance is not required for the process tool if the first data set and second data set match, or

indicating maintenance is required for the process tool if the first data set and second data set do not match;

wherein step i comprises:

A. detecting transition points in the first data set and the second data set so as to define data intervals wherein each data interval comprises the data between successive transition points;

B. computing a best fit of the data in each of the data intervals using basis functions; and

C. computing fitting errors between the data in the data intervals and the best fit and determining if the fitting errors are less than a predetermined threshold and recursively finding additional transition points as necessary to produce fitting errors less than the predetermined threshold.

23. (PREVIOUSLY PRESENTED): The computer readable medium of claim 22 wherein the data measurements include temperature measurements.

24. (PREVIOUSLY PRESENTED): The computer readable medium of claim 22 wherein the process comprises an electronic device fabrication process and the first data set comprises temperatures as a function of time and the second data set comprises temperatures as a function of time.

25. (CURRENTLY AMENDED): The computer readable medium of claim 22 wherein the data measurements include measurements of resistivity, dielectric constant, ion flux, deposition rate, or ~~etch rate~~ etch rate.

26. (CURRENTLY AMENDED): The computer readable medium of claim 22 wherein the first data set and the second data set include data measurements for electronic ~~device fabrication~~ device fabrication.

27. (CURRENTLY AMENDED): The computer readable medium of claim 22 wherein the first data set and the second data set include data measurements for flat panel display processing or lithography ~~mask processing~~ mask processing.

28. (PREVIOUSLY PRESENTED): The computer readable medium of claim 22 wherein the first data set and second data set include data measurements as a function of time; the method further comprising time-stretching a portion of the first data set or a portion of the second data set by inserting interpolated values so as to produce an equal number of data points in each portion of the data sets, so that the first data set and the second data set have substantially the same time reference for step iii.

29. (PREVIOUSLY PRESENTED): The computer readable medium of claim 22 wherein the ~~workpiece comprises~~ workpieces comprise a semiconductor wafer and the process is selected from the group consisting of post-exposure bake, plasma etching, plasma deposition, plasma enhanced chemical vapor deposition, chemical vapor deposition, and sputter deposition.

30. (PREVIOUSLY PRESENTED): The computer readable medium of claim 22 wherein the ~~workpiece comprises~~ workpieces comprise a semiconductor wafer for fabricating electronic devices and the data measurements are data measurements for fabricating electronic devices.

31. (PREVIOUSLY PRESENTED): The computer readable medium of claim 22 wherein the ~~workpiece comprises~~ workpieces comprise a semiconductor wafer and the data measurements are selected from the group consisting of etch rate, plasma potential, and RF power.

32. (PREVIOUSLY PRESENTED): The computer readable medium of claim 22 wherein step A comprises numerically differentiating the data measurements and searching for points at which the second derivative exceeds a predetermined threshold.

33. (PREVIOUSLY PRESENTED): The computer readable medium of claim 22 wherein step B comprises fitting the data intervals using a set of basis functions that include at least one of linear functions, exponentials, double exponentials, and sinusoids, polynomials, and other standard basis functions.